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AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended): Apparatus for premixing fuel and air to provide a fuel/air mixture, the apparatus comprising:

a fuel valve for controlling a flow of fuel;

an air valve for controlling a flow of air in accordance with the flow of fuel to provide a controlled fuel/air ratio;

a mixing tube configured for receiving and mixing the fuel and air, the mixing tube having an entrance, an axis, and an exit for discharging a fuel/air mixture; and

a mixture valve associated with said mixing tube exit and separate from the fuel valve and the air valve, the mixture valve including inner and outer mixture valve members that together define an exit flow area;

wherein the defined exit flow area includes at least two segmented, substantially opposed, mixture flow-directing area portions with respect to angular position about the mixing tube axis; and

wherein at least one of said inner and outer mixture valve members is movable relative to the other of said valve members to selectively vary the defined exit flow area with respect to time.

2. (Withdrawn): The premixer apparatus as in claim 1 wherein at least portions of said inner and outer valve members are formed from a ceramic material.

3. (Currently Amended): The premixer apparatus as in claim 1 wherein the inner mixture valve member is a nozzle fixed to the mixing tube and the outer mixture valve member is a skirt co-axially surrounding the nozzle with respect to the mixing tube

axis and having a skirt end, wherein the skirt end and the nozzle define an exit flow area, and wherein said defined exit flow area and said mixture velocity vary with relative positions of the skirt end and the nozzle during said relative movement there between.

4. (Previously presented): The premixer apparatus as in claim 3 wherein said skirt is fixed and wherein said nozzle is movable, relative to the mixing tube entrance.

5. (Previously presented): The premixer apparatus as in claim 3 wherein the nozzle includes one or more channels terminating in respective ports.

6. (Previously presented): The premixer apparatus as in claim 3 wherein the nozzle is an asymmetric nozzle.

7. (Withdrawn): The premixer as in claim 1 wherein the inner valve member includes a valve plate;

wherein the outer valve member includes a skirt with an end contoured to provide said segmented area portions; and

wherein said flow area and said mixture velocity vary with relative positions of the valve plate and the skirt end during said relative movement there between.

8. (Withdrawn): The premixer apparatus as in claim 7, wherein the skirt is fixed and the valve plate is movable, relative to the mixing tube entrance.

9. (Previously presented): A gas turbine engine including the premixer apparatus as in claim 1.

10. Cancelled.

11. (Currently Amended): ~~The combustion apparatus as in claim 10,~~

Apparatus for combusting fuel and air comprising:

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER ^{LLP}

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

an annular combustion chamber having an axis;
at least one premixer configured to receive fuel and air;
wherein said premixer has a venturi for mixing the received fuel and air to form a
fuel/air mixture and an exit in fluid communication with the combustion chamber for
discharging the fuel/air mixture, the venturi having an axis;
wherein the premixer exit further includes inner and outer members defining an
exit flow area, said exit flow area including area portions configured for channeling the
fuel/air mixture in substantially opposed tangential directions relative to the chamber
axis; and
wherein at least one of said inner and outer members is movable along said
venturi axis relative to the other to selectively vary said defined exit flow area with
respect to time, whereby a mixture discharge velocity can be varied;
wherein said premixer includes a compressed air flow path between a
compressed air source and said venturi, and a fuel flow path between a fuel source and
said venturi; and
wherein the combustion apparatus further includes an air valve and a fuel valve
disposed in the respective flow paths for controlling the fuel/air ratio of said fuel/air
mixture; and
wherein ~~said mixture valve~~ relative movement between said inner and outer
members varies the exit velocity of the controlled fuel/air ratio discharged mixture.

12. (Currently Amended): The combustion apparatus as in claim 11 further including an air valve actuator operably connected to move said air valve;

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
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~~a mixture valve~~ an actuator operatively connected to move said at least one movable member; and

a controller operatively connected to the air valve actuator and the ~~mixture valve~~ movable member actuator.

13. (Currently Amended): Apparatus for combusting fuel with air, the apparatus comprising:

an annular combustion chamber having an axis;

(1) means for controlling a flow of the fuel;

(2) means for controlling a flow of the air in accordance with the flow of fuel to provide a controlled fuel/air ratio;

at least one premixer configured to receive the fuel and air, the premixer further including

(1) (3) means for mixing the received fuel and air to form a fuel/air mixture,

(2) (4) exit means in fluid communication with the combustion chamber for distributing the fuel/air mixture to the combustion chamber; and

wherein said exit means further includes:

(i) means for defining an exit flow area, said exit flow area including area portions for channeling fuel/air mixture flow in substantially opposed tangential directions relative to the combustion chamber axis, and

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
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(ii) means separate from the fuel flow controlling means
and the air flow controlling means, for selectively varying
the defined exit flow area with respect to time.

14. (Previously presented): The combustion apparatus in claim 13 further
including means for sensing a parameter selected from the group consisting of torque,
fuel flow, and power; and

control means responsive to said parameter sensing means for controlling said
selectively varying means.

15. (Withdrawn): Apparatus for premixing fuel and air to provide a fuel/air
mixture, the apparatus comprising:

a mixing tube configured for receiving and mixing the fuel and air, the mixing tube
having an entrance, an axis, and an exit for discharging the fuel/air mixture;

a mixture valve associated with said mixing tube exit;

wherein said mixture valve includes coaxial inner and outer valve members
having respective ends that define an exit flow area;

wherein at least the outer valve member end is contoured such that the defined
exit flow area includes two opposed exit area portions with respect to angular position
about the mixing tube axis; and

wherein at least said inner valve member is movable relative to the outer valve
member to selectively vary the exit flow area with respect to time.

16. (Withdrawn): The premixer apparatus as in claim 15 wherein at least a
portion of said inner valve member is formed from a ceramic material.

17. (Withdrawn): Apparatus for combusting fuel and air comprising:

an annular combustion chamber having an axis;
at least one premixer configured to receive fuel and air;
wherein said premixer has a venturi for mixing the received fuel and air to form a fuel/air mixture, the venturi having an axis;
wherein the premixer has an exit in fluid communication with the combustion chamber for discharging the fuel/air mixture;
wherein the premixer exit includes inner and outer members defining an exit flow area;
wherein at least said outer valve member is configured to define exit flow area portions positioned for directing the fuel/air mixture in substantially opposed tangential directions relative to the chamber axis, and
wherein at least said inner member is movable relative to the outer member to selectively vary said defined exit flow area with respect to time, whereby a mixture discharge velocity can be varied.

18. (Withdrawn): The combustion apparatus as in claim 17 wherein portions of said inner and said outer members are formed from a ceramic material.

19. (Withdrawn): A gas turbine engine having the combustor apparatus of claim 17.

20. (Currently Amended): A method for controlling the velocity and direction of a fuel/air mixture discharged from a premixer apparatus, the apparatus having a fuel/air mixing tube flow-connected to respective sources of fuel and compressed air, the mixing tube having an axis, an inlet, and an exit for discharging the fuel/air mixture,
the method comprising:

controlling the rate of flow of fuel and rate of air flow into the mixing tube inlet to provide a controlled fuel/air ratio;

providing a mixture valve associated with the exit including inner and outer valve members together defining an exit flow area;

channeling the discharged fuel/air mixture in at least two opposed directions relative to angular position about the axis using the mixture valve; and

moving at least one of the inner and outer valve members relative to the other to increase or decrease the exit flow area, whereby the channeled fuel/air mixture velocity is respectively decreased or increased.

21. (Previously presented) The method as in claim 20 further including the steps of

sensing the pressure in the mixing tube upstream of the exit; and

controlling the position of said at least one of the inner and outer valve members relative to the other in accordance with the sensed pressure.

22. (Previously presented) The method of claim 21 wherein the controlling step includes the step of controlling the position to either one of two preselected positions.

23. Cancelled.

24. (Currently Amended): A gas turbine gas generator operable with a fuel source, the gas generator comprising:

an air compressor;

a turbine;

a shaft assembly interconnecting the air compressor and the turbine;

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

and a combustor operatively connected to provide combustion gases to the turbine;

wherein the engine further includes one or more premixers each having

(1) a mixing tube configured for receiving and mixing the fuel and air, the mixing tube having an axis and an exit for discharging a fuel/air mixture to the combustor; and

(2) a mixture valve associated with said mixing tube exit and including inner and outer valve members that define an exit flow area;

wherein the defined exit flow area includes at least two segmented, substantially opposed area portions with respect to angular position about the mixing tube axis;

wherein the segmented area portions include ports for directing the discharged fuel/air mixture relative to the mixing tube axis; and

wherein at least one of said inner and outer valve members is movable relative to the other of said valve members to selectively vary the defined exit flow area with respect to time;

~~The~~ the gas turbine gas generator ~~as in claim 23~~ further comprising:

a compressed air path interconnecting the compressor and each mixing tube;

a fuel path interconnecting the source of fuel and each mixing tube;

an air valve positioned in the compressed air path, and

a fuel valve positioned in the fuel path,

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HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
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wherein the air valve and fuel valve are separate from said mixture valve and are operable to control a fuel/air ratio of the mixture discharged from said mixing tube through said mixture valve.

25. (Previously presented): The gas turbine gas generator as in claim 24, wherein the gas turbine gas generator is a radial turbine gas generator having an annular combustor surrounding the turbine and the turbine having an axis;

wherein the generator has

- (1) two or more of said premixers spaced circumferentially about said turbine axis with respective mixing tube axes inclined with respect to said turbine axis,
- (2) a single air valve, and
- (3) a compressed air distribution manifold interconnecting the single air valve and the entrances of each of the mixing tubes of said premixers;

wherein the radial turbine has an exhaust cone; and

wherein the distribution manifold is disposed in an annular space surrounding the exhaust cone.

26. (Currently Amended): The gas turbine gas generator as in claim ~~23~~ 24, wherein the gas turbine gas generator is a radial turbine gas generator having an annular combustor surrounding the turbine and the turbine having an axis;

wherein the generator has

- (1) only a single one of said premixers disposed at one angular position relative to the turbine axis,

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER ^{LLP}

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
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~~(2) — a compressed air path interconnecting the air compressor and the mixing tube,~~

(3) (2) only a single air valve disposed in said compressed air path at a second angular position relative to the turbine axis spaced substantially 180° from the one angular position; and

wherein a portion of the compressed air path between said one air valve and the premixer mixing tube entrance includes at least one manifold extending in a circumferential direction relative to the turbine axis.

27. (Currently Amended) A gas turbine engine having the gas generator as in claim 23 24.

[[27.]] 28. (Currently Amended): A gas turbine gas generator for combusting fuel and air comprising:

a combustion chamber; and

a premixer having an exit and an inlet, the exit being in flow communication with the combustion chamber for mixing the fuel and air to provide a fuel/air mixture,

wherein the gas generator further comprises a fuel valve and an air valve for controlling the fuel/air ratio of the fuel and air supplied to the premixer inlet,

wherein the premixer further comprises a controllable mixture valve associated with the premixer exit separate from the fuel valve and the air valve and having first and second valve members that together define an exit flow area,

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HENDERSON
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GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
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wherein at least one of said first and second valve mixture members is movable relative to the other of said mixture valve members to selectively vary the defined exit flow area and a fuel/air mixture velocity.

[[28.]] 29. (Currently Amended) The gas turbine gas generator as in claim 27 28 wherein the combustion chamber is a single stage combustion chamber.

[[29.]] 30. (Currently Amended) The gas turbine gas generator as in claim 27 28 wherein the premixer includes a mixing tube having an axis, and wherein the fuel/air mixture is deflected away from the mixing tube axis by said valve.

[[30.]] 31. (Currently Amended) A method of controlling the velocity of a fuel/air mixture introduced to the combustion chamber of a gas turbine gas generator from a fuel/air premixer, the premixer having an exit in flow communication with the combustion chamber, the method comprising:

providing an air valve and fuel valve to control a fuel/air ratio of air and fuel entering the premixer;

providing a controllable mixture valve associated with the premixer exit and separate from the air valve and the fuel valve, the mixture valve including first and second mixture valve members that together define an exit flow area;

flowing the fuel/air mixture into the gas turbine gas generator combustion chamber through the mixture valve; and

moving at least one of the first and second mixture valve members relative to the other of the valve members to increase or decrease the exit flow area, whereby the fuel/air mixture velocity is respectively decreased or increased.

FINNEGAN
HENDERSON
FARABOW
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1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
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